

## ABSTRACT

A medical apparatus and method useful for the efficacious thermal treatment of lumen such as varicose veins during laser surgery is provided. The method includes inserting an optical fiber into a lumen at a treatment site which has at least two treatment segments. The light-emitting section of the optical fiber is aligned with a first treatment segment within the treatment site. Energy is emitted into the lumen at the first treatment segment and a temperature of the lumen is measured at the first treatment segment. The energy delivered to the treatment segment can be adjusted in response to the temperature measurement. The light-emitting section is moved to at least a second treatment segment within the lumen and energy is emitted into the lumen at the second treatment segment. During treatment at the second treatment segment, the temperature of the lumen is measured at the second treatment segment. This method can also include storing a temperature target in the memory device; generating a temperature signal using the temperature sensor; utilizing the temperature signal to determine the measured temperature; and comparing the measured temperature to the temperature target stored in the memory device. The light-emitting section is moved to the next treatment segment when the measured temperature is equal or greater than the temperature target.

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